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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,998	07/11/2003	Hae-Kyoung Kim	030681-531	2771

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EXAMINER	
ONEILL, KARIE AMBER	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/616,998	KIM, HAE-KYOUNG	
	Examiner	Art Unit	
	Karie O'Neill	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07-11-2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7-11-03,12-20-04*. 7-25-05, 8-11-05, 9-21-05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 9-10, 14-18 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Taft, III et al. (US 2005/0244697 A1).

With respect to Claims 1-3, 10 and 14-15, Taft discloses a composite electrolyte membrane for use in a fuel cell, where the fuel cell comprises an anode, a cathode, an electrolyte membrane disposed between the anode and cathode (paragraph 0041) and the electrolyte further comprising: a polymer having cation exchange groups (a proton conducting polymer based material); and an inorganic cation exchange material including clays or silicates having a layered structure and dispersed in the polymer.

Preferred clays or silicates include smectite, vermiculite, mica and mixtures thereof, wherein the smectite is selected from the group consisting of montmorillonite, saponite, beidellite, nontronite, hectorite and a mixture thereof (paragraph 0048).

With respect to Claims 4-5 and 16-17, Taft discloses the electrolyte membrane of Claim 1, wherein the silicate nanoparticles, more specifically the structure of the montmorillonite has a stacked nano-sized platelet structure having an average diameter of 100-1500 nm and the amount of the silicate nanoparticles is about 3% based on the total weight of the nanocomposite electrolyte membrane (paragraph 0050), preferably about 0.1% to 30% based on weight.

With respect to Claims 6-7, 9, 18 and 21, Taft discloses the electrolyte membrane wherein the cation exchange groups of the polymer are selected from the group consisting of sulfonate, phosphate and imide groups (paragraph 0058) and have a thickness of 60 microns (paragraph 0061).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taft, III et al. (US 2005/0244697 A1) in view of Grot et al. (US 5919583).

Taft, III et al. discloses the nanocomposite electrolyte membrane of Claim 1 above, but does not disclose expressly the polymer cation group as being a highly fluorinated polymer with sulfonate groups as proton exchange groups at terminals of side chains and containing fluorine atoms that amount to at least 90% of the total number of fluorine and hydrogen atoms bound to carbon atoms of the backbone and side chains of the polymer.

Grot et al. discloses cation exchange groups consisting of sulfonate, carboxylate, phosphate, imide, sulfonamide and sulfonimide groups, further including copolymers of trifluoroethyene, thetrafluoroethylene, styrene-divinyl benzene, and α,β,β-trifluorostyrene, with a polymer backbone which is highly fluorinated and the ion exchange groups are sulfonate groups and at least 90% of the total number of halogen and hydrogen atoms are fluorine atoms (column 3 lines 33-37 and 55-61).

Taft, III et al. and Grot et al. are analogous art because they are from the same field of endeavor fuel cell electrolyte membranes. At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the cation exchange groups of the Grot et al. reference with the electrolyte membrane of Taft, III et al. for increasing the transport of protons across the membrane and for enhanced

mechanical properties such as increased stiffness (Grot et al. column 3 lines 2 and 30-31).

Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taft, III et al. (US 2005/0244697 A1) in view of Yen et al. (US 5795496).

Taft, III et al. discloses the fuel cell of Claim 10 above, but does not disclose expressly wherein the cathode and anode comprising catalyst layers containing carbn supported platinum catalyst, and the anode further comprising a platinum-ruthenium catalyst.

Yen et al. discloses an anode formed from platinum-ruthenium alloy particles dispersed on high surface area carbon (column 3 lines 32-34) and a cathode in which platinum particles are bonded to a carbon backing material (column 3 lines 57-58).

Taft, III et al. and Yen et al. are analogous art because they are from the same field of endeavor fuel cell electrolyte membranes. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the anode and cathode materials of the Yen et al. reference with the fuel cell of Taft, III et al. so that more efficient electro-oxidation is realized (Yen et al. column 3 line 55).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571) 272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KAO

MICHAEL BARR
SUPERVISORY PATENT EXAMINER